

## Cutaneous sinus tract of dental origin in pediatric patient: A case report

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### ABSTRACT

Cutaneous sinus tract develop due to misdiagnosis of persistent dental infections as it may look similar to other cutaneous lesions and misdiagnosis may lead to cutaneous scar formation, psychological trauma to the patient so the correct identification of etiology and diagnosis is important. This is a case report of dentoalvolar abscess with extra oral sinus in relation to mandibular left first molar of an 11 year old male Pediatric patient. In this case report description of diagnosis, root canal treatment and surgical incision is presented.

**Keywords:** Dental infection, cutaneous sinus tract, Root canal treatment

### 1. INTRODUCTION

A chronic inflammation of pulpal origin is one of the reasons for an extra oral sinus of odontogenic origin (Kumar et al., 2013). Anatomical arrangement of adjacent muscles and fasciae, virulence of microorganism are responsible for extraoral sinus. The removal of the diseased pulp canal tissue, which results in minimal or no cutaneous scar development, is a straight forward and successful treatment for extraoral lesions when the etiology is correctly identified (Tekwani et al., 2019). Here we report a case of dentoalvolar abscess with extra oral sinus of an 11 year old male Pediatric patient. Root canal treatment was performed as the tooth was restorable. After treatment disappearance of radiolucency and recovery of extraoral lesion was observed.

### 2. CASE REPORT

A 12-year-old child presented to the Department of Pedodontics and Preventive Dentistry with a pus-filled lesion and swelling on the lower left jaw that had been present for two weeks. Patient appeared to be in good health until he noticed pus and swelling on the skin of his lower jaw two weeks ago. When the patient first observed the bulge, it was tiny, but it had increased rapidly over time. History of sudden and sharp pain in lower left region of jaw few months back that subsided and has not reoccurred. Patient was having Fever since 1 to 2 days. Extra oral inspection showed diffused



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pustule below the border of the mandible measuring  $1.5 \times 1$  cm in diameter, extended anteriorly 3 cm short of the chin and posterior 4 cm short form angle of the mandible (Figure 1). The colour of the lesion was yellowish white and borders appear to be prominent with erythematous surrounding skin. No other ulcerated area was seen elsewhere on the face. On palpation the lesion was tender and not fixed to the underline structures, paraesthesia was not present.

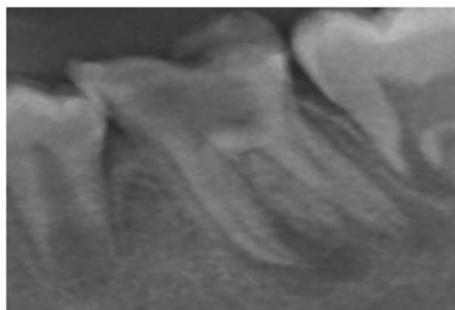
Intra oral inspections showed deep occlusal caries 36 (Figure 2). Intra oral radiograph showed coronal radiolucency involving enamel and dentin and approaching pulp periapically diffused radiolucency with ill-defined borders (Figure 3). On the basis of clinical and radiographic findings a final diagnosis of dentoalveolar abscess with extra oral sinus was made in relation to 36.



**Figure 1** Yellowish white pustule



**Figure 2** Deep occlusal caries with 36



**Figure 3** IOPA with 36

### Treatment

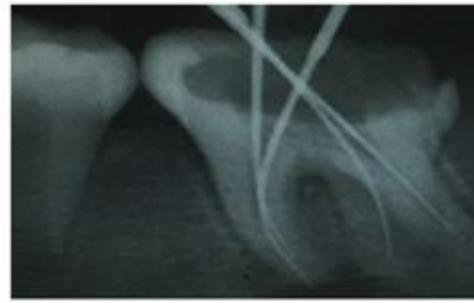
Parents of the patient were informed about the treatment and consent was taken. Small Incision was given for drainage and drainage was done on the first visit (Figure 4). Lesion was irrigated and debrided with Povidone-iodine and normal saline (Figure 5). Conservative nonsurgical root canal treatment is suggested as the tooth is restorable. Multiple visit Root canal treatment (RCT) was planned and recovery of the surrounding bone and the healing of the sinus tract were observed. An endodontic treatment was initiated on the same day and the working length was determined (Figure 6). The root canal was debrided using H file and the necrotic pulp removed. Very light filing was performed with copious irrigation using 0.5% sodium hypochlorite (NaOCl) to remove necrotic pulp tissue. A low concentration of NaOCl is used because of the increased danger of pushing NaOCl through the apex of tooth. The canal is dried with paper points and Calcium hydroxide mixed with chlorhexidine was used as intracanal dressing. In subsequent appointment dressing was changed.



**Figure 4** Incision and drainage

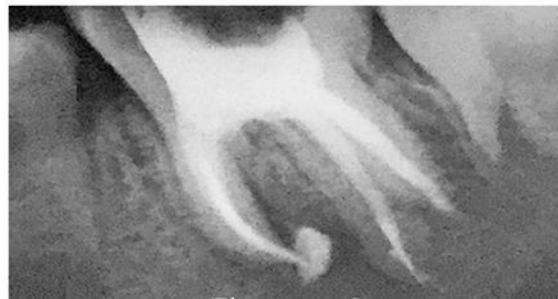


**Figure 5** Lesion after incision and drainage



**Figure 6** Working length determination

The lesion had healed and the tooth was non-tender to percussion. The tooth was unsealed, the intracanal medicament was removed, and the canal of the permanent molar was obturated with gutta purcha at this appointment (Figure 7).



**Figure 7** Obturation with 36

### Follow up

Patient was recalled at regular intervals. Swelling was found to be reduced and improvement in mouth opening was observed. Patient after 4 weeks revealed significant healing. Clinical examinations showed no sensitivity to percussion or palpation and the soft-tissues were healthy. Post-operative radiographs showed the progressive process of periapical healing. Stainless steel crown was given with 36 (Figure 8). After 3 months of follow up, the cutaneous lesion had healed completely with Minimum scar formation (Figure 9).



**Figure 8** Stainless steel crown with 36



**Figure 9** Healing after 3 months

### 3. DISCUSSION

Sinus track is defined as the channel leading from the enclosed area of the inflammation on the epithelial surface. Sinus tracts occurred more frequently in the mandibular than maxillary teeth (Kulkarni et al., 2012). Approximately 80% of documented instances are linked to mandibular teeth, while 20% are linked to maxillary teeth (Jose et al., 2016). It's unusual to have a dental-related cutaneous sinus tract. Despite the fact that the lesions have been thoroughly reported in medical and dentistry literature, they are still misdiagnosed. Careful questioning of the patient about past symptoms, such as oral trauma, periodontal disease, and oral hygiene regimens, may therefore help to establish dental etiology the foremost aim of treatment is to eliminate the source of

infection (Young & Tai et al., 2018). Radiographs are important to rule out other pathologies (Gattani et al., 2020). The majority of patients are unaware of intraoral symptoms and do not associate the skin lesion with the dental source. As a result, patients are more inclined to seek care from physicians rather than dentists. If etiology of extraoral lesion correctly identified and sinus tract of dental origin is diagnosed, then sinus tract usually heal within 7 to 14 days (Azizlou et al., 2020).

Periodontal disease and a dead pulp are the main sources of head and neck infection, so seeking the advice and opinion of a dentist is essential (McWalters et al., 1988). As the sinus tract provides drainage of exudate from the odontogenic primary site, it prevents swelling or pain from pressure build up thus a draining sinus tract maintains a localized condition and systemic involvement is rare (Tiddwell & Jenkins, 1997). In odontogenic infection, purulent discharge will migrate from the periapical area to the path of least resistance. The sinus tract exits either an intraoral or extraoral sinus, depending on the position of the muscle attachments and fascial sheaths, once the cortical plate has been breached. The infection may spread extraorally if the apices of the maxillary teeth are above the maxillary muscle attachments and the apices of the mandibular teeth are below the mandibular muscle attachments (Kotecha & Browne 1981; Thoma 1963). These sinus tracts were originally thought to be lined by epithelium and therefore to require a surgical intervention apart from the endodontic treatment (Harrison & Larson 1976). But later, studies suggested that it was lined by granulation tissue and not epithelium, which means that it could be intraoral or extraoral and that it could be treated by a non-surgical endodontic treatment. The standard treatment for cutaneous sinus tract infection caused by a dental source is to eliminate the source of infection through root canal therapy or extraction of the afflicted teeth. The drainage will finally stop, and the tract will close, which will take anywhere from 7 to 14 days. Even if no surgical procedure is performed, the cutaneous lesion will eventually heal (Young & Tai 2018).

The surgical and non-surgical modalities can be used to treat these cases. A non-surgical approach should be done initially. The success of the therapy and successful periapical healing are determined by proper cleaning, shape, and asepsis, sterilisation of the root canal and periradicular region, and root canal filling. Periapical Extraoral route and pain alleviation will be created by perforating the root of the tooth during root canal treatment and draining the pus through an orthograde method. One such approach is the shoelace procedure, which involves introducing a gauge piece soaked in Povidone-iodine into the sinus to create a channel for pus evacuation (Uppal et al., 2017). In this case, the tooth was restorable and the apex was closed, but final treatment of the draining sinus tract necessitates the removal of the infection's source through root canal treatment. A spontaneous closure of tract was expected in 5 to 14 days after root canal therapy (Sotiropoulos & Frmakis, 2014; Tekwani et al., 2019).

#### 4. CONCLUSION

Proper diagnosis is the basic requirement for the successful management of the odontogenic cutaneous sinus tracts of pulpal origin. These lesions remain a diagnostic stumbling block. Inappropriate diagnosis leads to the incorrect treatment which results in complication such as reoccurrence of sinus tract, infection, psychological trauma, scar formation.

##### Clinical significance

Proper diagnosis of facial lesion is very important. Differential diagnosis of extraoral sinus of dental origin should always be considered in case of facial lesions. Proper diagnosis will result in minimum scar formation and reduces psychological trauma related to aesthetics.

##### Informed consent

Written and oral informed consent was obtained from parents of the patient included in the study.

##### Conflicts of interest

The authors declare that they have no conflict of interest.

##### Funding

This study has not received any external funding.

##### Data and materials availability

All data associated with this study are present in the paper.

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